MTHRIL

```
MM      MM  TTTTTTTTTT  HH      HH    AAAAAA      IIIIII    NN      NN  TTTTTTTTTT
MM      MM  TTTTTTTTTT  HH      HH    AAAAAA      IIIIII    NN      NN  TTTTTTTTTT
MMMM  MMMM      TT      HH      HH  AA      AA      II      NN      NN      TT
MMMM  MMMM      TT      HH      HH  AA      AA      II      NNNN    NN      TT
MM  MM  MM      TT      HH      HH  AA      AA      II      NNNN    NN      TT
MM      MM      TT      HHHHHHHHHH  AA      AA      II      NN  NN  NN      TT
MM      MM      TT      HHHHHHHHHH  AA      AA      II      NN  NN  NN      TT
MM      MM      TT      HH      HH  AAAAAAAAAA      II      NN    NNNN      TT
MM      MM      TT      HH      HH  AA      AA      II      NN    NNNN      TT
MM      MM      TT      HH      HH  AA      AA      II      NN      NN      TT
MM      MM      TT      HH      HH  AA      AA      II      NN      NN      TT
MM      MM      TT      HH      HH  AA      AA    IIIIII    NN      NN      TT
MM      MM      TT      HH      HH  AA      AA    IIIIII    NN      NN      TT

LL          IIIIII    SSSSSSSS
LL          IIIIII    SSSSSSSS
LL            II    SS
LL            II    SS
LL            II    SS
LL            II      SSSSSS
LL            II      SSSSSS
LL            II            SS
LL            II            SS
LL            II            SS
LL            II            SS
LLLLLLLLL   IIIIII    SSSSSSSS
LLLLLLLLL   IIIIII    SSSSSSSS
```

```
0000        1              .TITLE  MTH$AINT - FLOATING TRUNCATION
0000        2              .IDENT  /1-006/          ; File: MTHAINT.MAR  Edit: JAW1006
0000        3
0000        4      ;
0000        5      ;*******************************************************************
0000        6      ;*                                                                 *
0000        7      ;*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                        *
0000        8      ;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.         *
0000        9      ;*  ALL RIGHTS RESERVED.                                           *
0000       10      ;*                                                                 *
0000       11      ;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED *
0000       12      ;*  ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE *
0000       13      ;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER *
0000       14      ;*  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY *
0000       15      ;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY *
0000       16      ;*  TRANSFERRED.                                                   *
0000       17      ;*                                                                 *
0000       18      ;*  THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE *
0000       19      ;*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT *
0000       20      ;*  CORPORATION.                                                   *
0000       21      ;*                                                                 *
0000       22      ;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS *
0000       23      ;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.        *
0000       24      ;*                                                                 *
0000       25      ;*                                                                 *
0000       26      ;*******************************************************************
0000       27      ;
0000       28      ;
0000       29      ; FACILITY: MATH LIBRARY
0000       30      ;++
0000       31      ; ABSTRACT:
0000       32      ;       This module contains routine MTH$AINT:
0000       33      ;       truncate a floating-point number.
0000       34      ;
0000       35      ;
0000       36      ;--
0000       37      ;
0000       38      ; VERSION: 0
0000       39      ;
0000       40      ; HISTORY:
0000       41      ;
0000       42      ; AUTHOR:
0000       43      ;       Jonathan M. Taylor, 30-Jul-77: Version 0
0000       44      ;
0000       45      ; MODIFIED BY:
0000       46      ;
0000       47      ;
0000       48      ;
```

MTHSAINT
1-006

F 6
- FLOATING TRUNCATION   16-SEP-1984 01:02:35 VAX/VMS Macro V04-00   Page 2
HISTORY ; Detailed Current Edit History 6-SEP-1984 11:20:14 [MTHRTL.SRC]MTHAINT.MAR;1   (2)

```
        0000    5C              .SBTTL  HISTORY         ; Detailed Current Edit History
        0000    51
        0000    52
        0000    53  ; Edit History for Version 0 of MTHSAINT
        0000    54  ;
        0000    55  ; 0-3   - Remove MTHSFLAG_JACKET.  TNH 5-July-78
        0000    56  ; 1-001 - Update version number and copyright notice.  JBS 16-NOV-78
        0000    57  ; 1-002 - Add "" to the PSECT directive.  JBS 21-DEC-78
        0000    58  ; 1-003 - Add a JSB entry point.  JBS 16-AUG-1979
        0000    59  ; 1-004 - Make the primary JSB entry MTHSAINT_R2 so that it can
        0000    60  ;           disable and restore IV.  SBL 26-Sept-1979
        0000    61  ; 1-005 - Remove MTHSAINT_R1, since the BASIC compiler has converted to
        0000    62  ;           the _R2 entry point.  JBS 26-NOV-1979
        0000    63  ; 1-006 - Mask all bits except IV when restoring PSW.  JAW 14-Jul-1981
        0000    64  ;
```

MTH$AINT
1-006

G 6

- FLOATING TRUNCATION
DECLARATIONS

16-SEP-1984 01:02:35   VAX/VMS Macro V04-00   Page 3
6-SEP-1984 11:20:14   [MTHRTL.SRC]MTHAINT.MAR;1   (3)

```
0000        66                .SBTTL  DECLARATIONS
0000        67
0000        68 ;
0000        69 ; INCLUDE FILES:
0000        70 ;
0000        71 ;      NONE
0000        72 ;
0000        73 ; EXTERNAL SYMBOLS:
0000        74 ;
0000        75 ;      NONE
0000        76 ;
0000        77 ;
0000        78 ; MACROS:
0000        79 ;
0000        80        $PSLDEF                        ; PSL Macros
0000        81 ;
0000        82
0000        83 ;
0000        84 ; PSECT DECLARATIONS:
00000000    85        .PSECT  _MTH$CODE      PIC, SHR, LONG, EXE, NOWRT
0000        86
0000        87 ;
0000        88 ; EQUATED SYMBOLS:
0000        89 ;
0000        90 ;      NONE
0000        91 ;
0000        92
0000        93 ;
0000        94 ; OWN STORAGE:
0000        95 ;
0000        96 ;      NONE
0000        97 ;
```

MTH$AINT
1-006

H 6

- FLOATING TRUNCATION   16-SEP-1984 01:02:35 VAX/VMS Macro V04-00   Page 4
MTH$AINT Real to Real truncation   6-SEP-1984 11:20:14 [MTHRTL.SRC]MTHAINT.MAR;1   (4)

```
                                  0000  99              .SBTTL  MTH$AINT          Real to Real truncation
                                  0000 100
                                  0000 101  ;++
                                  0000 102  ; FUNCTIONAL DESCRIPTION:
                                  0000 103  ;
                                  0000 104  ;       Return the arguments with zeroes to the right of the decimal
                                  0000 105  ;       point.
                                  0000 106  ;
                                  0000 107  ; CALLING SEQUENCE:
                                  0000 108  ;
                                  0000 109  ;       Truncation.wf.v = MTH$AINT (arg.rf.r)
                                  0000 110  ;
                                  0000 111  ; INPUT PARAMETERS:
                                  0000 112  ;
                                  0000 113  ;       The one argument is a single-precision floating-point value
                                  0000 114  ;       and is call-by-reference.
                                  0000 115  ;
                                  0000 116  ; IMPLICIT INPUTS:
                                  0000 117  ;
                                  0000 118  ;       NONE
                                  0000 119  ;
                                  0000 120  ; OUTPUT PARAMETERS:
                                  0000 121  ;
                                  0000 122  ;       NONE
                                  0000 123  ;
                                  0000 124  ; IMPLICIT OUTPUTS:
                                  0000 125  ;
                                  0000 126  ;       NONE
                                  0000 127  ;
                                  0000 128  ; COMPLETION CODES:
                                  0000 129  ;
                                  0000 130  ;       NONE
                                  0000 131  ;
                                  0000 132  ; SIDE EFFECTS:
                                  0000 133  ;
                                  0000 134  ;       Reserved Operand and Floating Underflow exceptions can occur.
                                  0000 135  ;
                                  0000 136  ;--
                            0000  0000 137       .ENTRY  MTH$AINT,         ^M<>
                        50   04 BC    50  0002 138       MOVF    @4(AP), R0                ; R0 = arg
   51   51   08  00      50   54  0006 139       EMODF   R0, #0, #1, R1, R1        ; R1 = fraction_part(R0)
                    50   51   42  000C 140       SUBF    R1, R0                    ; R0 = integer_part(R0)
                          04  000F 141       RET
                              0010 142
```

MTH$AINT   - FLOATING TRUNCATION   16-SEP-1984 01:02:35 VAX/VMS Macro V04-00   Page 5
1-006   MTH$AINT_R2 JSB entry point   6-SEP-1984 11:20:14 [MTHRTL.SRC]MTHAINT.MAR;1   (5)

I 6

```
                                    0010   144              .SBTTL  MTH$AINT_R2      JSB entry point
                                    0010   145
                                    0010   146    ;++
                                    0010   147    ; FUNCTIONAL DESCRIPTION:
                                    0010   148    ;
                                    0010   149    ;        Return the arguments with zeroes to the right of the decimal
                                    0010   150    ;        point.
                                    0010   151    ;
                                    0010   152    ; CALLING SEQUENCE:
                                    0010   153    ;
                                    0010   154    ;        Truncation.wf.v = JSB MTH$AINT_R2 (arg.rf.v)
                                    0010   155    ;
                                    0010   156    ; INPUT PARAMETERS:
                                    0010   157    ;
                                    0010   158    ;        The one argument is a single-precision floating-point value
                                    0010   159    ;        and is call-by-value.
                                    0010   160    ;
                                    0010   161    ; IMPLICIT INPUTS:
                                    0010   162    ;
                                    0010   163    ;        NONE
                                    0010   164    ;
                                    0010   165    ; OUTPUT PARAMETERS:
                                    0010   166    ;
                                    0010   167    ;        NONE
                                    0010   168    ;
                                    0010   169    ; IMPLICIT OUTPUTS:
                                    0010   170    ;
                                    0010   171    ;        NONE
                                    0010   172    ;
                                    0010   173    ; COMPLETION CODES:
                                    0010   174    ;
                                    0010   175    ;        NONE
                                    0010   176    ;
                                    0010   177    ; SIDE EFFECTS:
                                    0010   178    ;
                                    0010   179    ;        Reserved Operand and Floating Underflow exceptions can occur.
                                    0010   180    ;
                                    0010   181    ;--
                                    0010   182
                                    0010   183
                                    0010   184    MTH$AINT_R2::                                       ; R0 = arg
                                 52 DC 0010   185              MOVPSL  R2                              ; Save current PSL
                              20 B9 0012   186              BICPSW  #PSL$M_IV                        ; Disable integer overflow
      51 51 08 00 50 54 42 001A   187              EMODF   R0, #0, #1, R1, R1               ; R1 = fraction_part(R0)
               50 51 42 001A   188              SUBF    R1, R0                           ; R0 = integer_part(R0)
            52 FFDF 8F AA 001D   189              BICW    #^C<PSL$M_IV>, R2                ; Clear all but IV
                  52 B8 0022   190              BISPSW  R2                              ; Restore previous IV
                     05 0024   191              RSB                                     ; Return to caller
                        0025   192
                        0025   193              .END
```

MTH$AINT   00000000 RG   02
MTH$AINT_R2   00000010 RG   02
PSL$M_IV   = 00000020

```
                                    +------------------+
                                    ! Psect synopsis !
                                    +------------------+


PSECT name                      Allocation          PSECT No.  Attributes
----------                      ----------          ---------  ----------
.  ABS  .                       00000000  (    0.)  00 (   0.)  NOPIC  USR  CON  ABS  LCL  NOSHR  NOEXE  NORD  NOWRT  NOVEC  BYTE
$ABS$                           00000000  (    0.)  01 (   1.)  NOPIC  USR  CON  ABS  LCL  NOSHR   EXE   RD    WRT   NOVEC  BYTE
_MTH$CODE                       00000025  (   37.)  02 (   2.)   PIC   USR  CON  REL  LCL   SHR    EXE   RD   NOWRT  NOVEC  LONG


                              +---------------------------+
                              ! Performance indicators !
                              +---------------------------+


Phase                   Page faults   CPU Time      Elapsed Time
-----                   -----------   --------      ------------
Initialization               31       00:00:00.09   00:00:01.08
Command processing          134       00:00:00.45   00:00:02.16
Pass 1                      113       00:00:01.00   00:00:04.01
Symbol table sort             0       00:00:00.03   00:00:00.03
Pass 2                       46       00:00:00.46   00:00:02.13
Symbol table output           2       00:00:00.01   00:00:00.01
Psect synopsis output         2       00:00:00.02   00:00:00.02
Cross-reference output        0       00:00:00.00   00:00:00.00
Assembler run totals        330       00:00:02.06   00:00:09.44
```

The working set limit was 1050 pages.
4117 bytes (9 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 41 non-local and 0 local symbols.
193 source lines were read in Pass 1, producing 13 object records in Pass 2.
8 pages of virtual memory were used to define 7 macros.

```
                              +------------------------------+
                              ! Macro library statistics !
                              +------------------------------+


Macro library name                          Macros defined
------------------                          --------------
_$255$DUA28:[SYSLIB]STARLET.MLB;2                 4
```

98 GETS were required to define 4 macros.

There were no errors, warnings or information messages.

MACRO/ENABLE=SUPPRESSION/DISABLE=(GLOBAL,TRACEBACK)/LIS=LIS$:MTHAINT/OBJ=OBJ$:MTHAINT MSRC$:MTHAINT/UPDATE=(ENH$:MTHAINT)

MTH40VPI
LIS

MTHABS
LIS

MTHAINT
LIS

MTHAMOD
LIS

MTHERR
SDL

MTHASIN
LIS

MTHCDABS
LIS

MTHATAN
LIS

MTHATANH
LIS

MTHCDLOG
LIS

MTHJACKET
MAR

MTHBITOPS
LIS

MTHALOG
LIS

MTHDEF
FOR

MTHANINT
LIS

MTHCABS
LIS

MTHACOS
LIS

MTHCDEXP
LIS